March 17, 1913.

Mr. John Norris,
Chairman of Committee on Paper,
American Newspaper Publishers Assn.,
New York.

Dear Sir:

On behalf of this Library I beg to acknowledge receipt of a copy of your report on the Preservation of Paper, published as Bulletin No. 2795 of the American Newspaper Publishers Association, and to thank you for your courtesy in presenting it.

Yours truly,

Associate Librarian.

FLL/MR

American Newspaper Publishers Association
ROOM 903 WORLD BUILDING, NEW YORK
JOHN NORRIS, Chairman Committee on Paper

BULLETIN No. 2795 NEW YORK, NOV. 30, 1912

"B" SPECIAL

PRESERVATION OF PAPER.

LIBRARIANS AIMING TO FURNISH CURRENT HISTORY TO FUTURE GENERATIONS; THE BOOKWORM OF FACT; SPECIFICATIONS FOR A PAPER THAT WILL ENDURE INDEFINITELY; METHODS OF STORING PRINT PAPER ROLLS AND BOUND FILES OF NEWSPAPERS.

Paper submitted to a committee of the American Library Association, by JOHN NORRIS, Chairman of the Committee on Paper of the American Newspaper Association, November 26, 1912.

At a meeting of the Committee appointed by the American Library Association to study methods of preserving newspaper files for use of future generations, held November 26, 1912, at the Montague Branch of the Brooklyn Public Library. Mr. John Norris, Chairman of the Committee on Paper of the American Newspaper Publishers Association, submitted the following observations:

"Much has been said recently by Librarians about the inferiority of the newsprint paper which goes into bound files of the libraries for the purposes of reference and historical preservation. An examination of the places of storage in the libraries and of the conditions of storage convinces me that while the ordinary newsprint paper may not be in any respect suitable for purposes of preservation, the methods of handling those papers when bound are conducive to deterioration. This criticism applies not only to libraries but to newspaper offices and substantially to all places where newspaper files are stored. In many of the libraries, the files are subjected to treatment which deprives the paper of its required moisture. The Libraries dry out the newspapers by keeping them in rooms with an average temperature of 70 degrees, which is bound in the course of time to cause deterioration. The artificial heat renders the paper extremely brittle and makes it crumble like isinglass when handled. Excessive dampness is also disadvantageous.

HOW IMPROVEMENT MAY BE OBTAINED.

Improvement in the preservation of these historical records may be obtained:

1st: By using a printing paper that will endure indefinitely.

2d: By binding with materials that do not attract minute organisms.

3d: By storing under conditions (a) that do not deprive the paper of all its moisture; (b) or subject it to excessive dampness; (c) or subject it to chemical action produced by sunshine or gas or artificial heat or similar agencies of deterioration; (d) or propagate insects or other growth.

In gathering information that relates to the preservation of the printed paper, I have, at the request of newspaper publishers, inquired about the storage and preservation of newsprint rolls which I will also touch upon in this compilation.

The matter of paper preservation has attracted attention for centuries. Pliny says the ancients preserved their paper and books from moths by washing them with cedar or citron oil. In 1773 the Royal Society of Sciences at Gottingen offered a premium for the answers to questions relating to insects found in records and books. The answers accepted at that time indicated that five insects were destructive and that six appeared to be doubtful. They recommended that bookbinders use glue mixed with alum in place of paste. The ravages of insects vary according to latitude. The cigarette beetle has been described as the most destructive raider upon books. A publication entitled "Bookworms of Fact and Fancy" gives a list of insects and includes:

The bed bug, found in wood papers;
White ants, found in clay fillers;
Roaches, after oils and fats in parchments;
Beetles, in skin bindings;
Spring tails and Silver Fish, in dry and warm locations;
Centipedes and scorpions, which prey upon the insects found in libraries.

These live promoters of paper deterioration may work considerable damage in warm latitudes but in the important libraries which are located in the more northerly latitudes I believe their damage is negligible.

COMPOSITION OF NEWSPRINT PAPER.

Newsprint paper is made by the mixture of approximately 75 per cent. of mechanical wood pulp and 25 per cent. of sulphite wood pulp with a slight addition of clay and rosin.

The agencies leading to decay, according to my limited observation and study are:

Artificial heat
Gas combustion
Sunshine
Oxidation
Excess of mineral substances
Excessive dampness
Carelessness in bleaching and inferior materials in binding.

Mechanical pulp will deteriorate rapidly when exposed to air or light. R. W. Sindall, an English authority says many of the books printed on wood pulp paper between 1870 and 1880 are in a hopeless condition. With lower grade papers containing mechanical pulp the degradation of color and fibre is inevitable. Clayton Beadle points out that paper which is brittle, when very dry, becomes stronger and more pliant with a certain amount of moisture. With more moisture it loses its power of "felting." There is a point where the maximum strength is obtained. Prof. Herzberg, of the German Testing Institute, is credited with the statement that

paper containing three to five per cent. of moisture is at its strongest. Newsprint paper will absorb close to 10 per cent. of its weight in moisture. Most of this paper when manufactured contains about five per cent. of moisture or 100 pounds per ton of paper. It is liable to absorb 80 pounds additional of water per ton of paper in transit from mill to newspaper office. The additional weight of the paper when delivered has puzzled many newspaper publishers who almost invariably found that their rolls weighed more than the weight indicated at mill. A recent litigation in England disclosed the fact that jobbers had bought a less weight of paper than the customer had demanded, the jobbers relying upon the absorption of moisture in transit to make up the deficiency.

English librarians report that the ordinary novel printed on light, spongy paper has a life of about 40 issues. In other words, it will be unfit for further use and not even worth rebinding after circulation among 40 readers.

The American Chemical Society appointed a Committee in 1908 to find a paper more suitable for the records of the Society. It sought to ascertain the most durable, strongest, lightest, thinnest, most opaque, and cleanest paper having a surface not injurious to the eyesight that it was possible to procure for the money available. The specifications adopted by that Society were:

Rag, 75 per cent.
Bleached chemical wood or equivalent thereto, 25 per cent.
Ash (China clay), 5 per cent.
Weight (26x38,500)—42 pounds.
Strength (Mullen) 15 pounds.
Folding number (Schopper) if practicable, 10 pounds.
Sizing, three-quarter rosin—no starch.
Finish, uniform machine, same both sides.
Color, uniform, natural, paper must be well washed to remove soluble salts and bleaching materials.

The paper cost approximately 6½ cents per pound.

COMPLAINTS OF LIBRARIANS.

At a conference of librarians in 1909 at Bretton Woods, N. H., Frank P. Hill, Librarian of the Brooklyn Public Library read a paper on "The Deterioration of Newspaper Paper" wherein he narrated the results of an examination of the bound copies of Manhattan and Brooklyn newspapers filed in Brooklyn Library. He said: "In many instances papers published within the last forty years had begun to discolor and crumble to such an extent that it would hardly pay to bind those which had been folded for any length of time. Further investigation showed that practically all of these newspapers were printed on cheap wood pulp paper, which carries with it the seeds of early decay, and that the life of a periodical printed on this inferior stock is not likely to be more than fifty years." The librarian sent out circulars to publishers asking whether a better grade of paper was being used for running off extra copies for their own files and what, if any, means had been taken to preserve the files in their offices. The answers showed that no special paper was used and that no means were taken to preserve those in the worst condition. Inquiries were sent to paper manufacturers with no more satisfactory results. Mr. Hill had not then found any newspaper that printed extra copies on a better grade of paper but subsequent inquiry has disclosed that the Red Wing Republican, of Red Wing, Minnesota, prints 15 copies daily from which number it supplies paper to the Minnesota Historical Society and the Congressional Library, at Washington. It binds some for its own use and places them in vaults for reference. Its

Secretary and Manager, Mr. Jens K. Grondahl, says a fair grade of book paper is used. The paper has not obtained any scientific test. Mr. Hill's paper described the use of a liquid mixture in the German Governmental Paper Testing Institute of Berlin by the use of which it was aimed to indefinitely preserve wood pulp papers and make them fit to read for centuries to come. The method was to dip the sheets one by one into a "cellit" solution and then hang them up to dry or to spread them on large meshed nets. Mr. Hill suggested that it might be to the interest of publishers and librarians if a few copies of each issue of the newspapers should be printed on paper which had been treated with this chemical in the roll.

At a recent meeting of the Committee of the American Library Assn., Mr. Cedric Chivers, a bookbinder of Brooklyn, spoke of the successful experiments he had made with the German product "Cellit," by painting the edges of bound volumes with it. He was of the opinion that paper so treated would last 50 or 75 years and that the treatment could be repeated with the same result. The expense of treating the volume page by page might deter most librarians and publishers from attempting that method of preservation. He pointed out the necessity for binding the newspapers as quickly as possible so that they might not long be exposed to the air.

UNITED STATES GOVERNMENT SPECIFICATION

In 1904, Secretary Wilson of the Department of Agriculture, authorized the Bureau of Chemistry to investigate the subject of suitable papers for Government purposes. The investigation covered about 5,000 samples of paper and resulted in the issue of two circulars by the Bureau of Chemistry. Subsequently the Joint Committee of Congress on Printing appointed a Commission to pass upon this matter. Its report was adopted December 18, 1911, and now controls all Government supplies of paper and printing and binding materials. In the following month, a public bidding was held. The standard specification for printing paper that would "endure indefinitely" was as follows:

Weight, 25 x 40, 500; 50-pound basis (24x38-45).
Thickness shall not exceed .0035 inch.
Strength shall not be less than 18 points.
Stock shall be not less than 75 per cent. rag; the remainder may be bleached chemical wood, free from unbleached or ground wood pulp.
Ash shall not exceed 5 per cent.
Size—The total rosin shall not exceed 2 per cent.

This quality of paper is comparatively cheap, costing 4½ cents per pound or twice as much as the International Paper Company quoted as its newsprint price for the year 1912. The list of bidders and of the mills at which the paper would be made was:

	Cents per pound
American Writing Paper Co.	
Lots 22 b and 23 b	4.35
Lots 24 b and 25 b	4.55
C. H. Clinton Paper Co. of Phila., supplied by Nashua River Paper Corporation	4.5
Lewis Hoffenmaier, supplied from Bryant Paper Co.	5.1
C. W. Rantoul Co. of N. Y., supplied from Tidewater Paper Mills	4.99
King Paper Company, of Kalamazoo	5.5
R. P. Andrews Paper Co., supplied by West Virginia Pulp and Paper Co.	7.0
Bryant Paper Co.	5.1
Champion Coated Paper Co.	4.75

The award was made to the American Writing Paper Co. for 280 tons at 4.35 cents per pound and to C. H. Clinton Paper Co. of Philadelphia, at 4 ½ cents per pound for 76 tons. The Government Commission, in recommending this quality of paper said:

GOVERNMENT COMMISSION REPORT ON SPECIAL PAPER.

"The use of this paper should be limited to copies of those permanent publications intended for Government libraries or Government use, or, at most, be limited to the copies placed in the depository and university libraries of the country. This is intended as the permanent printing paper for the service, and while its use will not be extensive, it will serve a very important purpose. The important historical documents of the Government and its original scientific contributions should be printed on permanent paper. It is also desirable that such publications as the Statutes at Large should be printed upon this grade of paper."

Mr. Veitch, of the Bureau of Chemistry, who was a member of a Government Commission on Paper Specifications, and who has given much research to these matters says there is need for two sets of papers, one for ordinary handling and immediate accessibility, and one for storing away for future reference. It should be practically inaccessible. He writes: "No paper which is subject to a great amount of handling and use can prove absolutely permanent. Even the best paper, if handled, will deteriorate and go to pieces and if handled constantly would last but a few years. If handled very little, it would last for several hundred years and if the volumes were opened but several times a year and were stored in a suitable place, they would undoubtedly last for many hundreds of years. In other words, the problem is one largely of use and storage.

"The sheets should never be folded. They should be kept in binders and not folded repeatedly backward and forward upon themselves."

The Bureau of Chemistry and the Bureau of Standards at Washington concur in the matter of ink. They say:

"Very little difficulty would be experienced with the ordinary printer's ink. The black inks consist essentially of carbon, which is very permanent, and therefore very little anxiety need be felt for any publications printed with black ink."

HOW THE CONGRESSIONAL LIBRARY CARES FOR OLD NEWSPAPER FILES.

In the Congressional Library at Washington, special efforts are made to preserve eighteenth century files. The volumes are sealed in dust proof cases. They are bound with buckram and finished with materials recommended by the best authorities. The books lie flat with air spacing every six inches for ventilation. Channel iron ribs are used in the stacks. Air that has been washed or screened to remove dust is forced through the stacks and then exhausted. The temperature is kept uniform the year round. Flour paste boiled with alum is used for binding. Protecting sheets of paper are inserted between every double page. A thin tough linen ledger paper is used for guards. The onlv possible criticism that might be offered toward the perfection of these provisions for preservation is the occasional sunshine in the storage room. The volumes thus protected cost $10.00 each for binding. The ordinary binding of the current newspaper volumes in the Congressional Library costs $2.00 per volume. The deleterious effects of the products of gas combustion are avoided in the Congressional Library because electricity is used for illumination when artificial lighting is necessary. No records are kept of the humidity of the atmosphere. The cleanliness of the entire establishment is its insurance against animal organisms.

In the New York Public Library, the newspaper files are stored upright, in well ventilated stacks with some protection against dust by the screening of the air. The thermostat in the public file room was fixed in August at 68 degrees. The files in the North room and in stacks rest on steel ribbed shelving. No attempt is made to regulate the humidity of the storage place. Gas is not used in the building.

Four large steam pipes pass through the room of the Montague Branch of the Brooklyn Public Library, containing the old New York Herald files. There is no sunshine there but the main hall where most of the newspaper files are kept is flooded with sunshine. Some of the files lie flat and some are upright. The ordinary effort is made to preserve uniform temperature by heating in cool weather, but there is no special regulation of temperature, or humidity, or ventilation, or exclusion of dust.

The Philadelphia Public Library stores its newspaper files flat in the cellar. It permits the access of very little sunshine. There is some ventilation and some opportunity for variations of humidity due to changes in the atmosphere. Gas throws off its deleterious products of combustion in this room. Steam heated pipes pass through the cellar. The newspapers are bound in buckram.

May I suggest to your Committee that it gather information from the various libraries and historical societies upon a blank corresponding substantially to the following:

DATA RELATING TO STORAGE OF NEWSPAPER FILES IN PUBLIC LIBRARIES.

Date. .....
City .....
State .....

1. Name of library or society.
2. Number of daily newspapers, the regular issues of which are bound and preserved by the library or society.
3. Are the bound files stored flat or upright?
4. Is there sunlight in the room in which the bound files are stored?
5. Is gas used for illumination or any other purpose in any part of the library, especially near that room in which the bound files are stored?
6. Is there any ventilation around the bound files that will permit of the free ventilation of outside air?
7. Is there artificial heat in the room in which the bound files are stored?
8. Are the variations of humidity in outsire air permitted to reach the bound files?
9. Are the bound files stored in sealed cases or are they kept in such manner as to be protected from dust in the air?
10. Is any attempt made in binding to guard against insects?
11. What suggestions do you offer to secure the preservation of records of current history?

(Signed) Name .....
City .....
State .....

NO PROFIT IN PRINTING NEWSPAPERS ON SPECIAL PAPER.

Conceding the failure of the newspapers up to this time to do that which is more or less of an obligation upon them, it should be borne in mind that until recently very little data has been available for ascertaining a standard quantity of printing paper that would endure indefinitely under proper storage. From time to time, the subject has

been taken up by newspapers. Several canvasses have been made of the possible revenue to be obtained from such an issue. Apparently, the expenses would far exceed the probable revenue. The purchases would be restricted to the larger public libraries, some college libraries, and some Historical Societies. I doubt if subscriptions could be obtained for one hundred copies of such a publication. It seems like a dream as a commercial proposition, though some newspaper genius may accomplish such a result some day. A rich institution, or newspaper publisher or philanthropist, like Mr. Carnegie, who has enthusiasm for the accurate historical guidance of future generations, might endow such an effort and make it possible. In any event it lacks the attractiveness of direct profit. The mere cost of the paper would be a bagatelle. 100 copies of an ordinary daily newspaper upon the terms and specifications of the Government's contract would hardly exceed $2.50 per diem but the cost of preparing the plates and rolls to meet the varying conditions would carry the total cost to a figure that very few publishers would care to incur as a permanent obligation.

STORAGE OF NEWSPAPER ROLLS.

Some newspaper publishers have asked me to gather for them information that will enable them to store newsprint paper rolls under such conditions that will avoid deterioration. The experience in recent years has tended to the belief that paper stored by manufacturers in warehouses near the place of consumption has become so brittle within three months that it interfered with prompt printing of the paper by reason of breaks in the web and increased waste. This brittleness is attributed to the artificial heat or absence of moisture in the warehouses.

100,000 TONS OF PRINT PAPER ON HAND.

The print paper manufacturers of the United States carry nearly 100,000 tons of newsprint paper, of which the supply at the mill averages 40,000 tons, or 9 days' supply for all newspapers of the country 40,000
6 days' supply in transit, equalling 27,000
7 days' supply in places of consumption, equalling 31,500

Total 98,500

This total of approximately 100,000 tons of paper represents a selling value of about $3,500,000. Up to date there is no evidence of any general effort either by manufacturers or by consumers to standardize the method of storage or to improve conditions. Obviously it would be to their mutual advantages to encourage and promote every such effort.

The International Paper stores over 1800 tons of paper in the loft of the big shed at Pier 39, North River, New York. The place is not heated in any way and it is subject to all the variations of temperature and humidity which are incidental to the free play of the air on the river front. Its officers say they can store paper rolls indefinitely in that loft (as much as 3 years) and deliver the rolls to newspaper consumers in good condition. Their only trouble in storing paper is due to one extra handling which is however, less than cartage and storage in a warehouse. Some of the paper is stored in a warehouse in Franklin Street, New York, in order that the company may not have all of its eggs in one basket. The Chicago Daily News stores 1000 tons of newsprint paper as a reserve. Eighteen months ago during the pendency of a paper strike, it used 600 tons of paper that had been stored for five years in a cellar that was open to the

free play of the atmosphere. The rolls were set upright on strips that permitted ventilation under and on every side. The windows had never been closed in all that period. It is reported that when the stored paper was put upon the presses, it ran better than fresh paper.

New York City uses 750 tons of newsprint paper per diem. The total tonnage stored in this city is not readily ascertainable. The Great Northern Paper Company carries between 8,500 and 9,000 tons at Pier 42, North River, to supply the needs of its customers. The International Paper Company now has approximately 3,500 tons in storage in its loft and on cars in the City. In Kansas City, the Star carries 2,000 tons of paper. In Brooklyn, the Eagle carries a month's supply.

EXPERIENCE OF INTERNATIONAL PAPER COMPANY IN STORING PAPER.

Mr. A. E. Wright, Vice-President of the International Paper Company, was asked for suggestions for storing paper in the new building of the New York Times. He answered as follows:

"Our experience has taught us that paper stored in a room of fairly even temperature of from thirty to forty degrees, with a free circulation of air at all times, is best suited for the storage of newspaper.

"As you no doubt know, the warmer the air the higher percentage of moisture it carries, therefore we suggest a temperature of from thirty to forty degrees. When necessary to get as low a temperature as this during the summer months, we would suggest some sort of a refrigerating device through which the air would pass before entering the store room. It is well to avoid as far as possible excessive temperature and moisture conditions, and allow for as free a circulation of air as possible.

"We suggest the storing of paper on a ventilated platform fully three inches from the floor, this will allow circulation across the bottom of the rolls.

"As to the effect of light upon paper, we do not think that this has much bearing, as long as the wrappers are left on the rolls. We should say that the most satisfactory place for paper storage would be a basement with windows for ventilation on all four sides, and the paper stored on a platform such as recommended above.

"We feel sure from our experience in storing large quantities of paper in roll form that if our suggestions are followed out as outlined above, very little, if any, change in the character of the paper will be found, after it has been stored for a considerable period."

It should be stated that no one has ever attempted to adopt refrigeration as a method of preserving stored paper rolls.

VERTICAL OR HORIZONTAL POSITION FOR ROLLS.

Another phase of this matter of storing rolls is the question of carrying rolls in a horizontal or vertical position. Practically all the paper companies and newspapers store the roll vertically because it seems to require less space. The New York Times, in planning its new Annex, has aimed to store over 1000 tons of paper and to preserve the horizontal position of the roll to avoid the waste and labor incidental to up ending each roll and subsequent throwing of the roll to a horizontal position. In the Government printing office, five men have been observed helping to change the position of a roll.

Up to this time no effort has been made to collate the data relating either to the storage of newsprint paper rolls or the preservation of the printed paper. In the common interest some definite steps should be taken to improve conditions.